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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,195	11/13/2003	David Ross Graham	06446 USA	8277

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EXAMINER	
VANOY, TIMOTHY C	
ART UNIT	**PAPER NUMBER**
1754	

DATE MAILED: 05/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/712,195	GRAHAM ET AL.	
	Examiner	Art Unit	
	Timothy C. Vanoy	1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13,15-18,20,21,24-31,33,34,36-39 and 41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13,15-18,20,21,24-31,33,34,36-39 and 41* is/are rejected.

7)☒ Claim(s) *29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

a) There is no antecedent basis in either claim 1 or claim 18 for the "hydrogen conditioner" set forth in applicants' claim 29.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The person having ordinary skill in the art has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in this application reasonably reflect this level of skill.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-13, 15-18, 20, 21, 24-31, 33, 34, 36-39 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent Application Publication No. US 2002/0081235 A1 to Baldwin et al. in view of U. S. Patent 4,489,564 to Hausler et al.

Figure 1 and the description of figure 1 set forth on pg. 3, paragraph no's. 0039-0042 illustrate a method and apparatus for producing hydrogen gas from the reaction between a metal hydride and an aqueous solution, comprising:

Providing a water tank (1);

Providing a reactor (5) containing aluminum nuggets and sodium hydroxide powder: please see pg. 3, paragraph no. 0039;

Spraying water into the reactor (5) where the water reacts with the sodium hydroxide powder to produce a solution of sodium hydroxide, this solution of sodium hydroxide reacts with the aluminum nuggets to produce hydrogen gas and sodium-aluminum hydroxide by-product: please see pg. 3, paragraph no. 0039;

Passing the resulting hydrogen gas through a condenser (6), where evidently the condenser (6) condenses out any water in the hydrogen gas, and

Passing the resulting, dry hydrogen gas into a hydrogen storage tank (7), as set forth in applicants' claims 1, 2, 3, 6, 7, 8, 10, 11, 12, 13, 17, 18, 20, 21, 24, 25, 28, 33, 34, 36, 38, 39 and 41.

The difference between the applicants' claims and the Baldwin et al. reference is that applicants' claims 4, 5, 29 and 30 call for the use of a desiccant (evidently, to sorb water out of the hydrogen gas in the same manner that the condenser (6) dewaters the hydrogen gas, as illustrated in figure 1 in the Baldwin et al. reference), however it would have been obvious to one of ordinary skill in the art at the time the invention was made *to modify* the Baldwin et al. process and apparatus *by substituting* the water-sorbing desiccants of applicants' claims 4, 5, 29 and 30 *in lieu of* the water-removing condenser (6) illustrated in figure 1 in the Baldwin et al. reference *because* the courts have already determined that such substitution of functional equivalents within a process is *prima facie* obvious: please see the discussion of the *In re Fout* 675 F.2d 297, 213 USPQ 532 (CCPA 1982) court decision set forth in section 2144.06 in the MPEP (Rev. 3, Aug. 2005).

The difference between the applicants' claims and the Baldwin et al. reference is that applicants' claim 9 set forth that the first and second compartments are disposed within a single container, however it is submitted that this difference would have been obvious to one of ordinary skill in the art at the time the invention was made because of the expected advantage of saving space by housing the first and second compartments within the same container, rather than no containers at all or separate containers. Expected advantages are evidence of obviousness.

The difference between the applicants' claims and the Baldwin et al. reference is that applicants' claim 37 sets forth that the chemical hydride is heated, however it is submitted that this difference would have been obvious to one of ordinary skill in the art

at the time the invention was made because of the expected advantage of the heat to promote the reaction between the water or aqueous solution and the metal hydride to produce hydrogen gas.

The difference between the applicants' claims and the Baldwin et al. reference is that applicants' claims 1, 15, 26, 27 and 33 set forth that the hydrogen storage canister comprises a metal hydride.

U. S. Patent 4,489,564 to Hausler reports the use of a hydride storage canister for hydrogen (please see col. 1 lines 6-8). The storage material within the canister may be a metal alloy containing titanium, zirconium, chromium and manganese which evidently react with the gaseous hydrogen inserted into the canister to form metal hydrides (please see col. 1 lines 10-22). The Hausler patent reports the advantages of the canister as being able to store hydrogen in the metal hydride form without problems, safely and in a small space (please see col. 1 lines 14-16).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process and apparatus described in the Baldwin et al. reference by substituting the metal hydride hydrogen-storage canister of taught in col. 1 lines 6-22 in U. S. Patent 4,489,564 in lieu of the "storage tank (7)" described in paragraph no. 0041 in the Baldwin et al. reference, in the manner required by at least applicants' claims 1, 15, 26, 27 and 33, because of the expected advantages of avoiding problems and storing the hydrogen safely while using only a small space, as suggested by the disclosure set forth in col. 1 lines 13-16 in U. S. Patent 4,489,564 to Hausler et al.

Also, please note that the disclosure set forth in col. 1 lines 20-27 in U. S. Patent 4,489,564 that heat is released if hydrogen is introduced into the metal (evidently to form the metal hydride) and heat is wanted to remove the hydrogen, fairly suggests that the metal hydride storage canister be equipped with a heat exchanger as required by applicants' claims 16 and 31.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-13, 15-18, 20, 21, 24-31, 33, 34, 36-39 and 41 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-26 of copending Application No. 11-188,465. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of 10-712,195 and 11-188,465 disclose obvious variations of the

same method for generating hydrogen by contacting a chemical hydride with an aqueous solution.

The difference between the claims of 10-712,195 and 11-188,465 is that the claims of 10-712,195 call for the reaction of a chemical hydride whereas the claims of 11-188,465 call for the reaction of aluminum, however it is submitted that this difference would have been obvious to one of ordinary skill in the art at the time the invention was made because the scope of the "chemical hydride" set forth in the claims of 10-712,195 is broad enough to embrace the "aluminum" of the claims of 11-188,465 in view of the definition of "chemical hydride" set forth in claim 6 in 10-712,195.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1-13, 15-18, 20, 21, 24-31, 33, 34, 36-39 and 41 are directed to an invention not patentably distinct from claims 1-26 of commonly assigned 11-188,465. Specifically, the claims of 10-712,195 and 11-188,465 disclose obvious variations of the same method for generating hydrogen by contacting a chemical hydride with an aqueous solution.

The difference between the claims of 10-712,195 and 11-188,465 is that the claims of 10-712,195 call for the reaction of a chemical hydride whereas the claims of 11-188,465 call for the reaction of aluminum, however it is submitted that this difference would have been obvious to one of ordinary skill in the art at the time the invention was made because the scope of the "chemical hydride" set forth in the claims of 10-712,195

is broad enough to embrace the "aluminum" of the claims of 11-188,465 in view of the definition of "chemical hydride" set forth in claim 6 in 10-712,195.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP Chapter 2300). Commonly assigned 11-188,465, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(e), (f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee can, under 35 U.S.C. 103(c) and 37 CFR 1.78(c), either show that the conflicting inventions were commonly owned at the time the invention in this application was made, or name the prior inventor of the conflicting subject matter.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications pending on or after December 10, 2004.

Claims 1-13, 15-18, 20, 21, 24-31, 33, 34, 36-39 and 41 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-19 of copending Application No. 11-188,539. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of 10-712,195 and 11-188,539 disclose obvious variations of the same system

and method for generating hydrogen gas by contacting a chemical hydride with a reagent (which may be an aqueous solution: please see claim 8 in 10-712,195 and also claim 4 in 11-188,539) to produce hydrogen gas.

The difference between the claims of 10-712,195 and 11-188,539 is that the claims of 10-712,195 set forth the reaction of a "chemical hydride" whereas the claims 11-188,539 set forth the reaction of a "hydrogen precursor material".

Claim 3 in 11-188,539 sets forth the use of variety of chemical hydrides as the "hydrogen precursor material".

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to set forth that the "hydrogen precursor material" of the claims of 11-188,539 is the "chemical hydride" of the claims of 10-712,195 because claim 3 in 11-188,539 is evidence that the "hydrogen precursor material" is, in fact, a "chemical hydride".

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection.

The following references, which are indicative of the state of the art, are made of record:

U. S. Pat. App'n. Pub. US 2006/0088467 A1 disclosing methods of storing hydrogen in hydrogen storage systems;

U. S. Pat. App'n. Pub. US 2005/0211573 A1 disclosing a metal hydride hydrogen storage system;

U. S. Patent 7,037,483 B2 disclosing a process for producing high pressure hydrogen;

U. S. Patent 7,029,600 B2 disclosing a high capacity hydrogen storage material based on alanates;

U. S. Patent 6,991,770 B2 disclosing a hydrogen storage tank;

U. S. Patent 6,742,650 B2 disclosing a metal hydride storage canister;

U. S. Patent 6,651,701 B2 disclosing a hydrogen storage apparatus, and

U. S. Patent 6,638,348 B2 disclosing a metal hydride tank apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy C. Vanoy whose telephone number is 571-272-8158. The examiner can normally be reached on Mon-Fri 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Timothy C Vanoy
Timothy C Vanoy
Primary Examiner
Art Unit 1754

tv